

Amendments to the Claims:

The listing of claims below is intended to replace all prior listings of claims presented in the above-identified application.

Listing of Claims:

Claims 1 – 22 (CANCELED).

23. (CURRENTLY AMENDED) A recombinant pox virus comprising a nucleic acid sequence encoding an immunogenic MUC1 fragment comprising 5 to 25 MUC1 tandem repeat units, the nucleic acid sequence comprising
- a first nucleotide sequence encoding the amino acid sequence of SEQ ID NO:1 ~~as one of the tandem repeat units~~ that is SEQ ID NO:2; and
- a second nucleotide sequence encoding ~~[[4]]~~ 2 to 24 copies of the amino acid sequence of SEQ ID NO:1 ~~as the other 4 to 24 tandem repeat units~~ wherein, the second nucleotide sequence comprising ~~[[4]]~~ 2 to 24 ~~instances~~ copies of an altered nucleotide-sequence of SEQ ID NO:2 that is altered by changing wobbled nucleotides of the codons of SEQ ID NO:2, ~~the 4 to 24 instances encoding the other 4 to 24 tandem repeat units.~~
24. (PREVIOUSLY PRESENTED) The recombinant pox virus of claim 23, wherein the immunogenic MUC1 fragment comprises 6 to 14 tandem repeat units.
25. (PREVIOUSLY PRESENTED) The recombinant pox virus of claim 24, wherein the immunogenic MUC1 fragment comprises 9 tandem repeat units.
26. (PREVIOUSLY PRESENTED) The recombinant pox virus of claim 23, wherein the pox virus is selected from the group consisting of orthopox, suipox and avipox.
27. (CURRENTLY AMENDED) A pharmaceutical composition comprising a recombinant pox virus comprising a nucleic acid sequence encoding an immunogenic MUC1 fragment comprising 5 to 25 MUC1 tandem repeat units, the nucleic acid sequence comprising
- a first nucleotide sequence encoding the amino acid sequence of SEQ ID NO:1 that is SEQ ID NO:2 ~~as one of the tandem repeat units~~;

a second nucleotide sequence encoding ~~[[4]]~~ 2 to 24 copies of the amino acid sequence of SEQ ID NO:1 ~~as the other 4 to 24 tandem repeat units~~ wherein, the second nucleotide sequence comprising ~~[[4]]~~ 2 to 24 ~~instances~~ copies of an altered nucleotide sequence of SEQ ID NO:2 is altered by changing wobbled nucleotides of the codons of SEQ ID NO:2, ~~the 4 to 24 instances~~ copies encoding the other 4 to 24 tandem repeat units; and

a third nucleotide sequence encoding an immunomodulator.

28. (PREVIOUSLY PRESENTED) The pharmaceutical composition of claim 27, wherein the immunomodulator is selected from the group consisting of T-cell co-stimulatory factors and cytokines.
29. (PREVIOUSLY PRESENTED) The pharmaceutical composition of claim 28, wherein the cytokine is an interleukin.
30. (PREVIOUSLY PRESENTED) The pharmaceutical composition of claim 27, wherein the immunomodulator is both a T-cell co-stimulatory factor and a cytokine.
31. (PREVIOUSLY PRESENTED) The recombinant pox virus of claim 27, wherein the pox virus is selected from the group consisting of orthopox, suipox and avipox.
32. – 33. CANCELED
34. (PREVIOUSLY PRESENTED) The pharmaceutical composition of claim 27, wherein said MUC1 fragment comprises about 6 to 14 tandem repeat units.
35. (PREVIOUSLY PRESENTED) A method of generating an immune response in a mammal having a MUC1-expressing tumor, the method comprising:
 - (a) administering to the mammal the pox virus of claim 23 as a first pox virus; and
 - (b) administering an amount of a second pox virus selected from the group consisting of orthopox, suipox and avipox.
36. (PREVIOUSLY PRESENTED) The method of claim 35, wherein the second pox virus is from a viral genus different from said pox virus of step (a).

37. (PREVIOUSLY PRESENTED) The method of claim 35, further comprising administering to the mammal an immunomodulator.

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41. (PREVIOUSLY PRESENTED) A method for generating an immune response in a mammal that contains a MUC1-expressing tumor, the method comprising administering to said mammal the pox virus of claim 26.

42. (PREVIOUSLY PRESENTED) The recombinant pox virus of claim 23, wherein the pox virus is MVA.

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45. (PREVIOUSLY PRESENTED) The method of claim 37, wherein the immunomodulator is a cytokine or a co-stimulatory molecule.

46. (CURRENTLY AMENDED) The method of claim 45, wherein said co-stimulatory molecule is B7.

47. (PREVIOUSLY PRESENTED) The method of claim 46, wherein said B7 is B7.1 or B7.2.

48. (PREVIOUSLY PRESENTED) The method of claim 45, wherein the cytokine is an interleukin.

49. (PREVIOUSLY PRESENTED) The method of claim 35, wherein said first pox virus is selected from the group consisting of an orthopox virus vector, an avipox virus vector, a suipox virus vector, and a capripox virus vector.

50. (PREVIOUSLY PRESENTED) The method of claim 49, wherein the first pox virus is an orthopox virus.

51. (PREVIOUSLY PRESENTED) The method of claim 50, wherein the orthopox virus is a vaccinia virus.

52. (PREVIOUSLY PRESENTED) The method of claim 50, wherein the vaccinia virus is an MVA.

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54. (PREVIOUSLY PRESENTED) The method of claim 35, wherein the first pox virus is an orthopox virus and the second pox virus is an avipox virus.
55. (PREVIOUSLY PRESENTED) The method of claim 54, wherein the avipox virus is a fowlpox virus.
56. (PREVIOUSLY PRESENTED) The method of claim 54, wherein the orthopox virus is a vaccinia virus.
57. (PREVIOUSLY PRESENTED) The method of claim 56, wherein the vaccinia virus is MVA.
58. (PREVIOUSLY PRESENTED) The method of claim 35, wherein said first pox virus further comprises a nucleic acid sequence encoding an immunomodulator.
59. (PREVIOUSLY PRESENTED) The method of claim 35 or 58, wherein the second pox virus further comprises a nucleic acid sequence encoding an immunomodulator.
60. (CURRENTLY AMENDED) The recombinant pox virus of claim 23, wherein at least one of the ~~instances~~ copies of an altered nucleotide sequence is selected from the group consisting of SEQ ID NOS: 4 -12.
61. (CURRENTLY AMENDED) The pharmaceutical composition of claim 27, wherein at least one of the ~~instances~~ copies of an altered nucleotide sequence is selected from the group consisting of SEQ ID NOS: 4 -12.
62. (CURRENTLY AMENDED) The method of claim 35, wherein at least one of the ~~instances~~ copies of an altered nucleotide sequence is selected from the group consisting of SEQ ID NOS: 4 -12.
63. (CURRENTLY AMENDED) A recombinant pox virus comprising a nucleic acid sequence encoding an immunogenic MUC1 fragment comprising 5 to 25 MUC1 tandem repeat units, the nucleic acid sequence comprising
- a first nucleotide sequence having SEQ ID NO:2 ~~encoding the amino acid sequence of SEQ ID NO:1 as one of the tandem repeat units~~; and
- a second nucleotide sequence comprising [[4]] 2 to 24 altered nucleotide sequences encoding [[4]] 2 to 24 altered tandem repeats, wherein each altered tandem repeat is altered from SEQ ID NO:2 by wobbling at least one codon of SEQ ID NO:1 or by substituting at least one codon in SEQ ID NO:1 such that such substituted codons ~~each altered nucleotide sequence~~ is selected from the group consisting of substituting at least one of the glycines in the SEQ ID NO:1

to serine, substituting at least one of the serines in the SEQ ID NO:1 to glycine, and substituting the valine in the SEQ ID NO:1 to leucine.

64. (CURRENTLY AMENDED) A recombinant pox virus comprising a nucleic acid sequence encoding an immunogenic MUC1 fragment comprising 6 identical amino acid tandem repeat units, the nucleic acid sequence comprising
- a first nucleotide sequence encoding the amino acid sequence of SEQ ID NO:1 that is SEQ ID NO:2 ~~as one of the tandem repeat units~~; and
 - a second nucleotide sequence encoding 5 copies of the amino acid sequence of SEQ ID NO:1 as the other 5 tandem repeat units, the second amino acid sequence comprising 5 ~~instances~~ copies of an altered nucleotide sequence of SEQ ID NO:2 by changing wobbled nucleotides of the codons of SEQ ID NO:2, the 5 ~~instances~~ copies encoding the other 5 tandem repeat units.
65. (NEW) A recombinant pox virus comprising nucleic acid sequences encoding 5 to 25 MUC1 tandem repeat units, said tandem repeat units having an amino acid sequence of SEQ ID NO:1, wherein at least one of the nucleic acid sequences encoding the tandem repeats has SEQ ID NO:2 and at least one of other nucleic acid sequences encoding the tandem repeats is altered to reduce duplications of codons.
66. (NEW) The recombinant pox virus of claim 65, wherein at least one nucleic acid encoding the tandem repeats is altered by changing wobbled nucleotides of codons of SEQ ID NO:2.
67. (NEW) The recombinant pox virus of claim 65, wherein at least one nucleic acid encoding the tandem repeats is altered by the third base of threonine codons 3, 11 and 16 using ACG, ACT, and ACA respectively.